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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Serial No: 08/251,125
Filed: 05/31/94
Title: ELECTRONIC BALLAST WITH CONTROLLED-MAGNITUDE OUTPUT VOLTAGE
Applicant: Ole K. Nilssen
Art Unit: 2502
Examiner: SHINGLETON, M.

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I, OLE K. NILSSEN, HEREWITH CERTIFY THAT THE DATE OF DEPOSIT WITH THE U.S. POSTAL SERVICE OF THIS PAPER OR FEE IS: 7-10-96

APPEAL BRIEF

Commissioner of Patents and Trademarks
Washington, D.C. 20231

Pursuant to NOTICE OF APPEAL submitted on 05/30/96, Applicant herewith submits instant APPEAL BRIEF.

The required fee of $290.00 is provided-for by the attached check #5695.

Status of Claims

The pending claims are 1 through 10.

No claim is allowed.

Claims 9-10 are rejected under 35 USC 112, first paragraph, as lacking support in the original specification.

Claims 1-8 are rejected under 35 USC 103 as being unpatentable over Wallace in view of Pierce.

All of Examiner's rejections are being appealed.

A copy of all the pending claims is attached hereto by way of a document entitled CLAIMS on Appeal in Serial No. 08/251,125.

Real Party in Interest

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The above-identified Applicant is the Real Party in Interest.

Related Appeals

all appeals

To the best of his knowledge, Applicant has no currently pending appeal with materially related subject matter.

Status of Amendments

No amendment has been filed after Examiner's Final Office Action.

Summary of the Invention

With reference to Fig. 2, as modified in accordance with Figs. 5 & 6, the invention is briefly described by exemplary claim 2, as follows.

2. An arrangement comprising:

an inverter circuit (represented by main circuit elements 42, 43, 47, 49 -- see pages 4-5 of the specification; i.e., 2nd & 4th full paragraphs at page 4; 1st & 2nd paragraphs at page 4) having: (i) DC terminals (38, 39, and the center-tap connected with conductor 37 -- 2nd full paragraph at page 4) connected with a DC supply voltage (i.e., the DC voltage provided between B- line 39 and B+ line 38 -- 2nd full paragraph at page 4) and operative to draw DC input power therefrom, the magnitude of the DC supply voltage being substantially unaffected by the amount of power drawn therefrom; and (ii) AC terminals (i.e., the terminals across which elements 51 & 52 are series-connected -- 2nd paragraph at page 5) across which exists an AC output voltage, the magnitude of the AC output voltage being substantially proportional to the magnitude of the DC supply voltage;

an L-C circuit (consisting of elements 51 & 52 -- 4th full paragraph at page 4; 2nd paragraph at page 5) having an inductor means (51) and a capacitor means (52) effectively series-connected across the AC terminals, thereby giving rise to resonant action such as to cause an alternating current to be drawn from the AC terminals and a ballast output voltage to develop across the capacitor means; the capacitor means being connected with a pair of ballast output terminals (the terminals across which LOAD 26 is connected -- 1st paragraph at page 5; last paragraph at page 8) under a condition of little or no loading of the L-C circuit, the L-C circuit having a natural

resonance at or near the fundamental frequency of the AC output voltage and, due to resonant action, being operative to cause the amplitude of the ballast output voltage to have a first magnitude; under a condition of substantive loading of the L-C circuit, the amplitude of the ballast output voltage having a second magnitude; the second magnitude being distinctly lower than the first magnitude;

gas discharge lamp means (71 -- 3rd full paragraph at page 8) having a pair of lamp terminals (72, 73 -- 3rd full paragraph at page 8) operable to connect with the ballast output terminals and functional, when indeed so connected, to constitute said substantive loading of the L-C circuit; and

auxiliary sub-assembly (represented by element 81 -- last paragraph at page 8) operable to be connected between the L-C circuit and the inverter circuit (element 81 is electrically connected with tank capacitor 51", but is thermally connected with toroids 47, 49 -- see last line at page 8 and the first five lines at page 9 of the specification); with the auxiliary sub-assembly indeed so connected, and under said condition of little or no loading of the L-C circuit, the auxiliary sub-assembly being functional to cause the amplitude of the ballast output voltage to be substantially lower than it would have been in case it were not so connected.

With reference to above-described exemplary claim 2, various terms of claim 1 are to be understood as follows:

* "first sub-circuit" must be understood to mean power supply 23 (see 2nd & 3rd full paragraphs at page 4) of Fig. 2;
* "second sub-circuit" must be understood to mean what in claim 2 is referred-to as an "inverter circuit";
* "third sub-circuit" must be understood to mean what in claim 2 is referred-to as an "L-C circuit"; and
* "fourth sub-circuit" must be understood to mean what in claim 2 is referred-to as an "auxiliary sub-assembly".

Issues

The issues presented for review are:

(1) the appropriateness of Examiner's rejection of claims 9 and 10 under 35 USC 112, first paragraph;

(2) the appropriateness of Examiner's rejection of claims 1-8 under 35 USC 103 over Wallace and Pierce.

Grouping of Claims

The claims at issue are represented by two groups:

Group 1 -- claims 9-10; which stand rejected under 35 USC 112, first paragraph, as lacking support in the disclosure; and

Group 2 -- claims 1-8; which stand rejected under 35 USC 103 as being unpatentable over Wallace and Pierce.

ARGUMENTS

Re Group 1

Examiner rejected claims 9-10 under 35 USC 112, first paragraph, as lacking support in the original specification.

Applicant traverses these rejections for the following reasons.

(a) In support of his position, Examiner states that:

"Applicant sets forth an impossibility in newly presented claims 9 and 10. There will always be a load across two nodes that will drop the voltage across these two nodes".

To Applicant, this sounds like gibberish.

That is, Applicant is utterly incapable of divining any relevant meaning from Examiner's statement, and is therefore unable to respond.

Exactly what is the "impossibility" Examiner is referring to?

What "two nodes" does Examiner mean to refer to?

Applicant has re-read claims 9 and 10 and can not find anything therein that can even remotely be interpreted an "an impossibility".

Re Group 2

Examiner rejected claims 1-8 under 35 USC 103 as being unpatentable over Wallace and Pierce.

Applicant traverses these rejections for the following reasons.

(b) In supporting his position, Examiner states that:

"Wallace discloses all aspects of the claimed invention except for the use of protection means that limits the output magnitude of the inverter's output to a value lower than that if there were no protection means".

That is a grossly erroneous statement and demonstrates to Applicant that Examiner utterly fails to understand both the structure and the operation of Wallace's Control Circuit.

In support of this allegation, Applicant refers to exemplary claim 2, which includes the following feature:

"an L-C circuit having an inductor means and a capacitor means effectively series-connected across the AC terminals, thereby to give rise to resonant action such as to cause an alternating current to be drawn from the AC terminals and a ballast output voltage to develop across the capacitor means; the capacitor means being connected with a pair of ballast output terminals; under a condition of little or no loading of the L-C circuit, the L-C circuit having a natural resonance at or near the fundamental frequency of the AC output voltage and, due to resonant action, being operative to cause the amplitude of the ballast output voltage to have a first magnitude; under a condition of substantive loading of the L-C circuit, the amplitude of the ballast output voltage having a second magnitude; the second magnitude being distinctly lower than the first magnitude".

This feature is neither described nor even faintly suggested by Wallace.

For instance, Wallace does <u>not</u> include "an L-C circuit having an inductor means and a capacitor means effectively <u>series-connected</u> across the AC terminals, thereby giving rise to resonant action such as to cause an alternating current to be drawn from the AC terminals and a ballast output voltage to develop across the capacitor means".

If Examiner were to continue to hold a contrary position, he is requested to point out exactly where Wallace discloses such a feature. More particularly and mainly for his own edification, Examiner should answer the following questions: (i) Where is Wallace's equivalent of Applicant's "capacitor means"?; (ii) Across which two of Wallace's terminals exists the equivalent of Applicant's "ballast output voltage"?; and (iii) In what way does Wallace show the equivalent of "an inductor means and a capacitor means ... <u>series-connected</u> across the AC terminals"?

In exemplary claim 2, the ballast output voltage -- which is provided at the ballast output terminals -- is developed by series-resonant action of the L-C circuit (which is series-resonant at the fundamental frequency of the inverter's AC output voltage). The lamp output voltage is applied across the fluorescent lamp; which means that in Applicant's circuit the capacitor means is effectively connected in parallel with the fluorescent lamp. In Wallace, the fluorescent lamp is connected in series with the capacitor means.

In Wallace, Examiner might argue that the inductor means and the capacitor means are series-connected across Wallace's AC output terminals by way of the fluorescent lamp; which, inter alia, means that when the fluorescent lamp is removed, the resonant L-C series circuit automatically becomes fully disconnected. (Which, by the way, means that there is no need to use Pierce's "protection means" in Wallace's circuit.)

That is, with the fluorescent lamp non-connected, Wallace's capacitor means 26 (i.e., the capacitor which resonates with the leakage inductance of transformer 15 at the fundamental inverter frequency (see his column 2, lines 53-56) is not series-connected with any inductance at all.

(c) In Applicant's claimed invention, the fluorescent lamp is parallel-connected across the tank-capacitor; and the tank-capacitor is combined with a tank-inductor to form an L-C series-combination which is connected directly across the inverter's AC output terminals and is series-resonant at the fundamental frequency of the AC output voltage provided thereat.

This circuit topography is totally different from that of Wallace. In Wallace, there are two L-C circuits: (i) one is formed by capacitor 25 combined with the leakage inductance of transformer 15 and is resonant at the third harmonic of the inverter's AC output voltage; and (ii) the other one is formed by capacitor 26 in combination with the same leakage inductance and is resonant at the fundamental frequency of the inverter's AC output voltage, except that this latter combination is only formed after the lamp has ignited. However, neither of the two resulting topographies corresponds to the topography of Applicant's claimed invention.

Claims limit effect

(d) Clearly, in the absence of any beneficial results, Examiner's only motivation for combining Pierce's teachings with those of Wallace is that of trying to attain Applicant's claimed invention.

no reason

That is, with reference to his column 5, lines 65-75, Wallace expressly describes how he circumvents the very problem to which Examiner seeks to apply Pierce.

(e) As would be readily understood by a rational person, a skilled artisan would not consider modifying a given product (such as Wallace's Control Circuit) except if he could clearly see that the modification would result in a substantive benefit and that it could be accomplished without significant chances of incurring unexpected problems or unreasonable costs. However, even if the proposed modification might result in substantive benefit, he would only consider actually modifying this product if he were also to consider the proposed modification to be feasible.

Modifying Wallace's circuit by somehow incorporating thereinto certain aspects of Pierce's teachings is not a simple proposition. Aside from not seeing any benefit in doing so, even an expert would likely be unable to see clearly what ramifications might result in trying to do so.

Thus, Examiner -- who can not be presumed to possess even ordinary skill in the pertinent art -- goes far past his rational limits by asserting (as in fact he implicitly does) that a skilled artisan would see clearly that Wallace's circuit could feasibly be modified by incorporating thereinto certain parts of Pierce's Power Source.

Yet, Examiner has utterly failed to provide evidence to the effect that a skilled artisan would know: (i) <u>how</u> to feasibly modify Wallace's Control Circuit in the manner proposed; as well as (ii) <u>why</u> he would consider doing so. In real life, if a skilled artisan were to consider a proposed modification to be non-feasible he would certainly not seek to effectuate it.

Ole K. Nilssen, <u>Pro Se</u> Applicant

CLAIMS on Appeal in Serial No. 08/251,125

1. An arrangement comprising:

a first sub-circuit having a pair of power line input terminals across which is applied a power line voltage from an ordinary electric utility power line; the first sub-circuit supplying a DC supply voltage across a pair of DC output terminals; the magnitude of the DC supply voltage being substantially the same irrespective of the magnitude of any current being drawn from the DC output terminals;

a second sub-circuit having a pair of DC input terminals and a pair of high-frequency voltage output terminals; the DC input terminals being connected with the DC output terminals; the DC supply voltage being present across the DC input terminals; a high-frequency voltage being provided across the high-frequency voltage output terminals; the peak-to-peak magnitude of the high-frequency voltage being proportional to the magnitude of the DC supply voltage; the fundamental frequency of the high-frequency voltage being substantially higher than that of the power line voltage;

a third sub-circuit having a tank-inductor and a tank-capacitor effectively series-connected across the high-frequency voltage output terminals; the third sub-circuit having a natural series-resonance frequency at or below the fundamental frequency of the high-frequency voltage; a high-magnitude voltage being present across the tank-capacitor as well as between a pair of lamp output terminals; the combination of the first, second and third sub-circuits being characterized in that, in the absence of substantial load power being drawn from the lamp output terminals, the RMS magnitude of the high-magnitude voltage will attain an unacceptably high level;

a gas discharge lamp having a pair of lamp input terminals operable to connect with the lamp output terminals; the gas discharge lamp being characterized in that, if indeed so connected, it will draw power from the lamp output terminals to a degree sufficient to constitute said substantial load power; and

a fourth sub-circuit connected between the third sub-circuit and the second sub-circuit; the fourth sub-circuit being responsive to the RMS magnitude of the high-magnitude output voltage and operative, in case the gas discharge lamp were to fail to draw sufficient power from the lamp output terminals, to cause the RMS magnitude of the high-magnitude output voltage to be significantly lower than it would have been if the fourth sub-circuit had not been so connected.

2. An arrangement comprising:

an inverter circuit having: (i) DC terminals connected with a DC supply voltage and operative to draw DC input power therefrom, the magnitude of the DC supply voltage being substantially unaffected by the amount of power drawn therefrom; and (ii) AC terminals across which exists an AC output voltage, the magnitude of the AC output voltage being substantially proportional to the magnitude of the DC supply voltage;

an L-C circuit having an inductor means and a capacitor means effectively series-connected across the AC terminals, thereby giving rise to resonant action such as to cause an alternating current to be drawn from the AC terminals and a ballast output voltage to develop across the capacitor means; the capacitor means being connected with a pair of ballast output terminals; under a condition of little or no loading of the L-C circuit, the L-C circuit having a natural resonance at or near the fundamental frequency of the AC output voltage and, due to resonant action, being operative to cause the amplitude of the ballast output voltage to have a first magnitude; under a condition of substantive loading of the L-C circuit, the amplitude of the ballast output voltage having a second magnitude; the second magnitude being distinctly lower than the first magnitude;

gas discharge lamp means having a pair of lamp terminals operable to connect with the ballast output terminals and functional, when indeed so connected, to constitute said substantive loading of the L-C circuit; and

auxiliary sub-assembly operable to be connected between the L-C circuit and the inverter circuit; with the auxiliary sub-assembly indeed so connected, and under said condition of little or no loading of the L-C circuit, the auxiliary sub-assembly being functional to cause the amplitude of the ballast output voltage to be substantially lower than it would have been in case it were not so connected.

3. The arrangement of claim 2 further characterized in that the amount of DC input power being drawn by the DC terminals is distinctly higher under the condition of substantive loading of the L-C circuit as compared with the condition of little or no loading of the L-C circuit.

4. The arrangement of claim 2 further characterized in that the alternating current is of lagging phase compared with the phase of the AC output voltage.

5. The arrangement of claim 2 further characterized in that the phasing of the alternating current is such as to lag the phasing of the AC output voltage.

6. The arrangement of claim 2 further characterized in that, as long as the auxiliary sub-assembly is indeed connected between the L-C circuit and the inverter circuit, the amplitude of the ballast output voltage has a magnitude distinctly lower than said first magnitude.

7. An arrangement comprising:

an inverter circuit having: (i) DC terminals connected with a DC supply voltage and operative to draw DC input power therefrom, the magnitude of the DC supply voltage being substantially the same irrespective of the amount of power being drawn therefrom; and (ii) AC terminals across which exists an AC output voltage, the magnitude of the AC output voltage being proportional to the magnitude of the DC supply voltage;

an L-C circuit having an inductor means and a capacitor means effectively series-connected across the AC terminals, thereby giving rise to resonant action such as to cause an alternating current to be drawn from the AC terminals and a ballast output voltage to develop across the capacitor means; the capacitor means being connected with a pair of ballast output terminals; under a condition of little or no loading of the L-C circuit, the L-C circuit having a natural resonance at or near the fundamental frequency of the AC output voltage and, due to resonant action, being operative to cause the amplitude of the ballast output voltage to have a first magnitude; under a condition of substantive loading of the L-C circuit, the amplitude of the ballast output voltage having a second magnitude; the second magnitude being distinctly lower than the first magnitude;

gas discharge lamp means having a pair of lamp terminals operable to connect with the ballast output terminals and functional, when indeed so connected, to constitute said substantive loading of the L-C circuit; and

an auxiliary sub-assembly operable to be connected with the L-C circuit as well as with the inverter circuit; the auxiliary sub-assembly, when indeed so connected, being functional under the condition of little or no loading of the L-C circuit to cause the amplitude of the ballast output voltage to assume a third magnitude; the third magnitude being distinctly lower than the first magnitude.

8. The arrangement of claim 7 further characterized in that the third magnitude is distinctly higher than the second magnitude.

9. An arrangement comprising:

an inverter circuit having: (i) DC terminals connected with a DC supply voltage and operative to draw DC input power therefrom; and (ii) AC terminals across which exists an AC output voltage, the magnitude of the AC output voltage being substantially the same irrespective of the amount of power being drawn from the AC terminals;

an L-C circuit having an inductor means and a capacitor means effectively series-connected across the AC terminals, thereby giving rise to resonant action such as to cause an alternating current to be drawn from the AC terminals and a ballast output voltage to develop across the capacitor means; the capacitor means being connected with a pair of ballast output terminals; under a condition of little or no loading of the L-C circuit, the L-C circuit having a natural resonance at or near the fundamental frequency of the AC output voltage and, due to resonant action, being operative to cause the amplitude of the ballast output voltage to have a first magnitude; under a condition of substantive loading of the L-C circuit, the amplitude of the ballast output voltage having a second magnitude; the second magnitude being distinctly lower than the first magnitude;

gas discharge lamp means having a pair of lamp terminals operable to connect with the ballast output terminals and functional, when indeed so connected, to constitute said substantive loading of the L-C circuit; and

an auxiliary sub-assembly operable to be connected with the L-C circuit as well as with the inverter circuit; the auxiliary sub-assembly, when indeed so connected, being functional under the condition of little or no loading of the L-C circuit to cause the amplitude of the ballast output voltage to assume a third magnitude; the third magnitude being distinctly lower than the first magnitude.

10. The arrangement of claim 9 further characterized in that the frequency of the AC output voltage is lower under a condition of substantive loading of the L-C circuit than it is under a condition of little or no loading of the L-C circuit.